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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/914,699	08/14/2002	Martyn Poliakoff	2577/104	1008

2101 7590 12/05/2005  
BROMBERG & SUNSTEIN LLP  
125 SUMMER STREET  
BOSTON, MA 02110-1618

EXAMINER

KEYS, ROSALYND ANN

ART UNIT	PAPER NUMBER
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1621

DATE MAILED: 12/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/914,699	POLIAKOFF ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Rosalynd Keys	1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2005 and 19 October 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12-30 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Status of Claims***

1. Claims 1-30 are pending.  
Claims 1-10, and 12-30 are rejected.  
Claim 11 is objected.

### ***Specification***

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the limitation for the fluids alkyne, hydrocarbon and nitrogen, as disclosed in claim 6, lines 4 and 5, *is not disclosed in the specification (emphasis added)*.

### ***Allowable Subject Matter***

3. The indicated allowability of claim 1-17, 19, 20, 22, and 23 is withdrawn in view of the newly discovered reference(s) to Sun (US 6,046,373) and Sun et al. (US 5,962,800). Rejections based on the newly cited reference(s) follow.
4. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
5. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to teach or fairly suggest using a catalyst wherein the source of acid is provided by a sulfonic acid group.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1621

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1-10, and 12-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun (US 6,046,373) alone or in view of Sun et al. (US 5,962,800).

Sun teaches a process to convert oxygenates to olefins or ethers in the presence of heterogeneous catalysts, which have been modified (see entire disclosure, in particular column 1, line 50 to column 8, line 57). The catalyst may be further treated after modification (see column 5, line 66 to column 6, line 4). The temperature, pressure and WHSV are disclosed at column 7, line 47 to column 8, line 38. Representative oxygenates include, but are not necessarily limited to, lower straight chain or branched aliphatic alcohols, ethers, carbonyl compounds (aldehydes, carboxylic acids, carbonates, and the like), and also compounds containing hetero-atoms, such as, halides, mercaptans, sulfides, amines, and mixtures thereof (see column 7, lines 3-33). Thus, although 1,6-hexane diol is not expressly taught, its use and the products obtained therefrom, is clearly suggested, since 1,6-hexane diol is a C<sub>2</sub>-C<sub>10</sub> aliphatic diol (see column 7, lines 15-22). One or more diluents may be fed to the reaction zone with the oxygenate feed and may include, but are not necessarily limited to helium, neon, argon, krypton, nitrogen, carbon monoxide, carbon dioxide, water, hydrogen, long-chain paraffins, other hydrocarbons, aromatic

Art Unit: 1621

compounds, and mixtures thereof (see column 8, lines 38-52). A variety of reactor systems may be used to practice the disclosed invention and include but are not necessarily limited to a fluidized bed reactor, a circulating fluid bed reactor with continuous regeneration, a riser reactor, a fixed bed reactor and a moving bed reactor (see column 8, lines 53-57).

Sun differs from the instant invention in that Sun prefers the oxygenate feed be contacted in the vapor phase, whereas the instant invention is carried out under supercritical conditions or at near-critical conditions for the fluid acting as solvent. However, Sun clearly suggests that his reaction may be carried out in a supercritical fluid (see column 7, lines 47-49). The skilled artisan would have been motivated to carry out the reaction of Sun using supercritical conditions in order to obtain different conversions and selectivities of feedstock-to-product as taught by Sun (see column 7, lines 47-52).

Sun further differs from claim 9, in that Sun fail to teach the use of inert carrier as support for his catalyst.

Sun et al. teach that the performance of zeolitic catalysts and certain molecular sieve catalysts, in the preparation of light olefins from oxygenates, can be improved by using monolithic supports (see entire disclosure, in particular column 1, lines 18-59).

One having ordinary skill in the art at the time the invention was made would have found it obvious to utilize a monolithic support, as taught by Sun et al., as a carrier for the zeolites and molecular sieve catalysts of Sun, since Sun et al. teach that the use of said supports will improve the performance of the catalyst in the preparation of light olefins from oxygenates.

### ***Response to Amendment***

#### **Specification**

10. The objection to the abstract of the disclosure is withdrawn because the Patent No. GB 0000672 after the word near in line 2 has been deleted (see amendment to abstract filed September 30, 2005).

11. The objection to the specification as failing to provide proper antecedent basis for the claimed subject matter "not more than 10", as disclosed in claim 3, line 2 and "wherein the catalyst includes a

Art Unit: 1621

promoter" in claim 10, lines 1 and 2, is withdrawn, since these limitations have been added to the specification in the amendment filed October 19, 2005.

### ***Response to Arguments***

#### **Specification**

12. The objection to the specification as failing to provide proper antecedent basis for the fluids alkyne, hydrocarbon and nitrogen, as disclosed in claim 6, lines 4 and 5, is maintained because there is no support in the specification for these fluids. Specification page 8, lines 14-17 disclose suitable media, which does not include any alkynes, hydrocarbons other than those named, or nitrogen. The only fluid disclosed in the examples is carbon dioxide. To overcome this objection the Applicants need to specifically point to where these limitations are taught in the specification or amend the specification to include said limitations.

#### **Claim Rejections - 35 USC § 112**

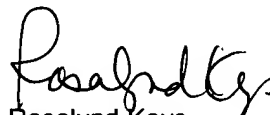
13. Applicant's arguments, see pages 7 and 8 of Applicants remarks, filed September 30, 2005, with respect to the rejection of claims 18, 21, and 24-30 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement have been fully considered and are persuasive. The rejection of claims 18, 21, and 24-30 has been withdrawn.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rosalynd Keys whose telephone number is 571-272-0639. The examiner can normally be reached on M and F 3:00-8:00 pm and T-TR 5:30-10:30 am.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann Richter can be reached on 571-272-0646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1621

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rosalyn Keys  
Primary Examiner  
Art Unit 1621

December 1, 2005